

**NORTH CAROLINA DIVISION OF  
AIR QUALITY**

**Application Review**

**Issue Date:**

**Region:** Mooresville Regional Office  
**County:** Cleveland  
**NC Facility ID:** 2300372  
**Inspector's Name:** Carlotta Adams  
**Date of Last Inspection:** 08/22/2016  
**Compliance Code:** 3 / Compliance - inspection

Facility Data	Permit Applicability (this application only)
<p><b>Applicant (Facility's Name):</b> Cleveland County Generating Facility</p> <p><b>Facility Address:</b>            Cleveland County Generating Facility            240 Battleground Road            Kings Mountain, NC 28086</p> <p><b>SIC:</b> 4911 / Electric Services  <b>NAICS:</b> 221119 / Other Electric Power Generation</p> <p><b>Facility Classification: Before:</b> Title V <b>After:</b>  <b>Fee Classification: Before:</b> Title V <b>After:</b></p>	<p><b>SIP:</b> 2D .0530  <b>NSPS:</b> NA  <b>NESHAP:</b> NA  <b>PSD:</b> Yes  <b>PSD Avoidance:</b> NA  <b>NC Toxics:</b> NA  <b>112(r):</b> NA  <b>Other:</b></p>

Contact Data			Application Data
Facility Contact	Authorized Contact	Technical Contact	
Chris Pierce O&M Manager (704) 471-9502 240 Battleground Road Kings Mountain, NC 28086	Chris Lane Plant Manager (704) 278-6601 5755 NC 801 Highway Salisbury, NC 28147	Sam Sharpe SPC Environmental Compliance (205) 257-6204 600 North 18th Street Birmingham, AL 35203	<p><b>Application Number:</b> 2300372.17A  <b>Date Received:</b> 03/29/2017  <b>Application Type:</b> Modification  <b>Application Schedule:</b> TV-Significant  <b>Existing Permit Data</b>  <b>Existing Permit Number:</b> 09881/T04  <b>Existing Permit Issue Date:</b> 07/19/2016  <b>Existing Permit Expiration Date:</b> 12/31/2018</p>

**Total Actual emissions in TONS/YEAR:**

CY	SO2	NOX	VOC	CO	PM10	Total HAP	Largest HAP
2015	4.00	174.00	7.74	48.16	47.62	5.66	3.69 [Formaldehyde]
2014	2.50	122.10	5.44	34.81	33.79	4.06	2.69 [Formaldehyde]
2013	2.80	46.10	1.95	13.21	12.26	1.51	1.04 [Formaldehyde]
2012	---	12.30	0.8500	2.06	4.26	0.3553	0.1399 [Hydrogen chloride (hydrochlori)]

<p><b>Review Engineer:</b> Joseph Voelker</p> <p><b>Review Engineer's Signature:</b> _____ <b>Date:</b> _____</p>	<p><b>Comments / Recommendations:</b></p> <p><b>Issue</b> 09881/T05  <b>Permit Issue Date:</b>  <b>Permit Expiration Date:</b></p>
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## I. Purpose of Application

The Cleveland County Generation Facility (CCGF), operated by Southern Power Company (SPC) is a simple-cycle power plant located in Cleveland County, North Carolina. The CCGF was originally designed and permitted to have a nominal generating capacity of 1140 MW using six dual-fueled Siemens SGT6-5000F simple-cycle combustion turbines. The plant is fueled by pipeline-quality natural gas and ultra-low-sulfur distillate fuel oil. Total annual operation of the facility is limited 26,520,000 MMBtu period (12,000 full load equivalent turbine hours) per rolling consecutive 12- month period.

An application was submitted requesting the following (verbatim from permit application):

As discussed during the January 13, 2017 meeting between SPC and the North Carolina Division of Air Quality (NC DAQ) and described in the permitting applicability letter submitted to DAQ on February 8, 2016, the CCGF turbine manufacturer recommends the turbines be started and shut down on natural gas prior to and following operations on fuel oil. Starting and shutting down the turbines on fuel oil can lead to "coking" of the turbine nozzles, which can cause maintenance and reliability issues. Firing natural gas for a portion of startups and shutdowns helps alleviate this problem.

The CCGF Air Quality Permit (Permit No. 09881T04) limits combustion of fuel oil in the turbines to 76,644 million BTUs during a 24-hour period (*Proviso 2.2 A.1.d.iii.*). The permit further limits the combustion of fuel oil in the turbines to 59,612 million BTUs during any 24-hour period that natural gas has been fired in one or more of the turbines (*Provisos 2.2 A.1.f. and 2.2 A.1.g.* ). Therefore, as currently written, the permit limits the turbine to only 59,612 million BTUs during a 24-hour period when following the manufacturer's recommendations of combusting natural gas during a portion of the turbine startup and shutdowns.

SPC would like to propose the following changes to the operational limits related to daily fuel oil combustion contained in Section 2.2 A.1 of the facility's Air Quality Permit. Note the **BOLD underlined text** are the proposed changes to the existing permit conditions

2.2 A.1.f - For each 24-hour period that natural gas is fired in one or more of the turbines **within the normal operation load range defined in 2.2 A.1.h.**, fuel oil combustion in the four combustion turbines (ID Nos. ES1 through ES4) combined shall not exceed 59,612 million BTUs (28 full load equivalent hours) total per consecutive 24-hour period, which is an average of (14,903 million BTUs) (7full load equivalent hours) for each turbine per consecutive 24-hour period.

2.2 A.1.g. - The Permittee may not burn natural gas in any combustion turbine **within the normal operation load range defined in in 2.2 A.1.h.**, during any 24-hour period that fuel oil firing in all the combustion turbines (ID Nos. ES1 through ES4) combined is more than 59,612 million BTUs (28 full load equivalent hours).

As indicated by the proposed revisions, SPC is not proposing to increase the total daily heat input or any emission limits allowed by the permit. Rather, the revisions only clarify the permit language to ensure that the units may combust natural gas for a portion of a startup and shutdown instead of fuel oil, as recommended by the manufacturer, without reducing the amount of normal oil operations allowed per day. Since this clarification ensures SPC may utilize natural gas in lieu of oil during a portion of startup and shutdown on a day in which the unit will be operated on oil, SPC believes the proposed permit revision will not increase emissions and could actually reduce emissions.

This engineer generally agrees with the comments above. These operating restrictions are found under the 15A NCAC 02D .0530 Prevention Of Significant Deterioration permit condition at Section 2.2 A.1. The intent of the operation limits in Section 2.2. A.1.d were for operation during normal operation, which is effectively defined in Section 2.2

A.1.d.h. In the original modeling analyses and consistent with modeling policy at that time, only normal operations at various loads were modeled. All pollutants were modeled below the applicable Significant Impact Levels (SIL). Upon review of the original modeling analysis and application, the pollutant of concern most likely to be impacted by this operating restriction change would be PM10 which has a 24-hour SIL. From the application, natural gas combustion has lower emission rates than fuel oil combustion for all modeled pollutants. The worst case PM10 emission rate is 9.10 lb/hr when combusting natural gas and 69 lb/hr when combusting fuel oil. It is clear then that burning natural gas in place of fuel oil would result in less PM10 emissions and hence would be a preferable fuel for combustion.

The Permit will be revised with the suggested clarification language. The changes addressed in the permit application will be addressed as a Title V major modification pursuant to 15A NCAC 2Q .0516. See Section VII for details.

## II. Chronology

Date	Description
03/29/2017	An application was received and assigned app no. 2300372.17A.
<del>MM/DD/YYYY</del>	<del>Public Notice published on NCDENR-DAQ website; concurrent public/EPA comment period begins</del>
<del>MM/DD/YYYY</del>	<del>Public comment period ends. No comments received.</del>
<del>MM/DD/YYYY</del>	<del>EPA comment period ends. No comments received.</del>

## III. Modification Description / Regulatory Review

This modification has implications with respect to 15A NCAC 02D .0530 Prevention of Significant Deterioration and is fully discussed in Section I. above. The requested clarification language will not result in the need to revise the original BACT analysis or original air dispersion modeling analysis.

## IV. NSPS, NESHAPS, PSD, Attainment Status, 112(r), and CAM

All regulatory implications associated with this modification are discussed in Sections I. and III. above.

## V. Compliance History

*As excerpted from the compliance inspection report of August 22, 2016 by Carlotta Adams from the Mooresville Regional Office.*

Based on my observations during this inspection, this facility appeared to be in compliance with the applicable air quality regulations.

The facility has not had any violations within the past five years as noted in the compliance inspection report.

## VI. Changes Implemented in Revised Permit

Existing Condition No.	New Condition No.	Changes
Cover Letter	Same	<ul style="list-style-type: none"> <li>• Used current shell language, updated permit numbers, dates, etc.</li> <li>•</li> </ul>
Permit, page 1	Same	<ul style="list-style-type: none"> <li>• Revised dates, permit numbers, etc using current shell standards</li> </ul>
2.2 A.1	Same	2D .0530 condition

Existing Condition No.	New Condition No.	Changes
f and g		The following language was added to clarify when the operating restrictions apply “within the operation load range defined in Section 2.2 A.1.h”
2.4	Same	<ul style="list-style-type: none"> <li>• Made a few typographical corrections; “CSAPR” was indicated by “TR”</li> </ul>
General Conditions	Same	<ul style="list-style-type: none"> <li>• Updated to Version 5, created 06/08/2017 by Heather Sands: Removed “State enforceable only” from GC MM.</li> </ul>

## VII. Public Notice/EPA and Affected State(s) Review

The changes addressed in the permit application will be addressed as a Title V major modification pursuant to 15A NCAC 2Q .0516. A notice of the DRAFT Title V Permit shall be made pursuant to 15A NCAC 2Q .0521. The notice will provide for a 30-day comment period, with an opportunity for a public hearing. Copies of the public notice shall be sent to persons on the Title V mailing list and EPA. Pursuant to 15A NCAC 2Q .0522, a copy of each permit application, each proposed permit and each final permit pursuant shall be provided to EPA. Also pursuant to 2Q .0522, a notice of the DRAFT Title V Permit shall be provided to each affected State at or before the time notice provided to the public under 2Q .0521 above. Consistent with 15 A NCAC 02Q .0525, the EPA will have a concurrent 45-day review period.

## VIII. Recommendations

TBD

~~It is recommended that permit no. 09881T05 be issued.~~